Name…… **Index No……..**

School…… **Candidate's sign…….**

Date…….

233/3
CHEMISTRY
PRACTICAL
PAPER 3
JULY / AUGUST 2010
Time: 2 ¼ Hours

MANGA DISTRICT JOINT EVALUATION TEST – 2010

Kenya Certificate of Secondary Education (K.C.S.E)

233/3
CHEMISTRY
PRACTICAL
PAPER 3
JULY / AUGUST 2010
Time: 2 ¼ Hours

INSTRUCTIONS TO CANDIDATES

- Write your name and index number in the spaces provided above.
- Answer all the questions in the spaces provided
- You are not allowed to start working with the apparatus for the first 15minute of the 2 ¼ hours. This time is to enable you read the question paper and make sure you have all the chemicals and apparatus that you may need
- All workings must be clearly shown where necessary
- Mathematical tables and silent electronic calculators may be used

FOR EXAMINERS USE ONLY

QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORES
1	19	
2	13	
3	08	
TOTAL SCORE	**40**	

This paper consists of 12 printed pages.
Candidates should check the question paper to ensure that all pages are printed as indicated and no questions are missing

1. You have been provided with

i) Solution M which is hydrochloric acid of unknown concentration

ii) Solution C which is sulphuric (VI) acid molarity 0.05M

iii) Solution E which is sodium hydroxide solution of unknown concentration

iv) Phenolphthalein indicator

You are required to

a) Standardise sodium hydroxide solution E

b) Use the standardized solution E to determine the concentration of solution M.

Procedure I

Fill a clean burette with solution C. Fit the pipette with a pipette filler and transfer 25.0cm^3 of solution E into a 250cm^3 conical flask. Add 2 drops of phenolphthalein indicator and titrate. Record your results in the table below.

Repeat the experiment two more times so as to obtain concordant results.

Table I

	1	2	3
Final burette reading (cm^3)			
Initial burette reading (cm^3)			
Volume of solution C used (cm^3)			

(4mks)

a) Calculate the average volume of solution C used. (show the values that you've averaged) (1mk)

b) Write a balanced equation for reaction taking place in the conical flask (1mk)

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c) Calculate the number of moles of solution C used in the titration (1mk)

d) Calculate the number of moles of solution E that were in 25.0cm^3

e) Calculate the concentration of solution E in moles per litre of solution (2mks)

Procedure II

Fill the clean burette with solution M (hydrochloric acid). Fit the pipette with a pipette filler and transfer 25.0cm^3 of solution E into a 250cm^3 conical flask. Add 2 drops of phenolphthalein indicator and titrate. Record your results in the table below. Repeat the experiment two more times to obtain consistent results.

Table II

	1	2	3
Final burette reading (cm^3)			
Initial burette reading (cm^3)			
Volume of solution M (used)			

(4mks)

f) Calculate the average volume of solution M use. (show the values you've averaged)

g) Write the equation for the reaction that took place in the conical flask (1mk)

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h) Calculate:

i) The number of moles of solution M that reacted completely with 25.0cm^3 of sodium hydroxide (E) (1mk)

ii) The concentration of hydrochloric acid in moles per litre (2mks)

2. You are provided with;

i) Clean magnesium ribbon labeled solid X

ii) 2.0M hydrochloric acid labeled solution L

iii) Stop clock / watch

You are required to determine the rate of reaction between magnesium and hydrochloric acid at different concentrations

Procedure:

i) Place 4 test-tubes on a test tube rack and label them 1, 2, 3 and 4.
Using 10ml measuring cylinder, measure out the volumes of 2.0M hydrochloric acid, solution L as shown in table III and pour them into the corresponding test – tubes.
- Wash the measuring cylinder and use it to measure the volumes of distilled water as indicated in the table and pour into the corresponding test-tubes.

ii) Cut out four pieces each of exactly 1cm length of clean magnesium ribbon

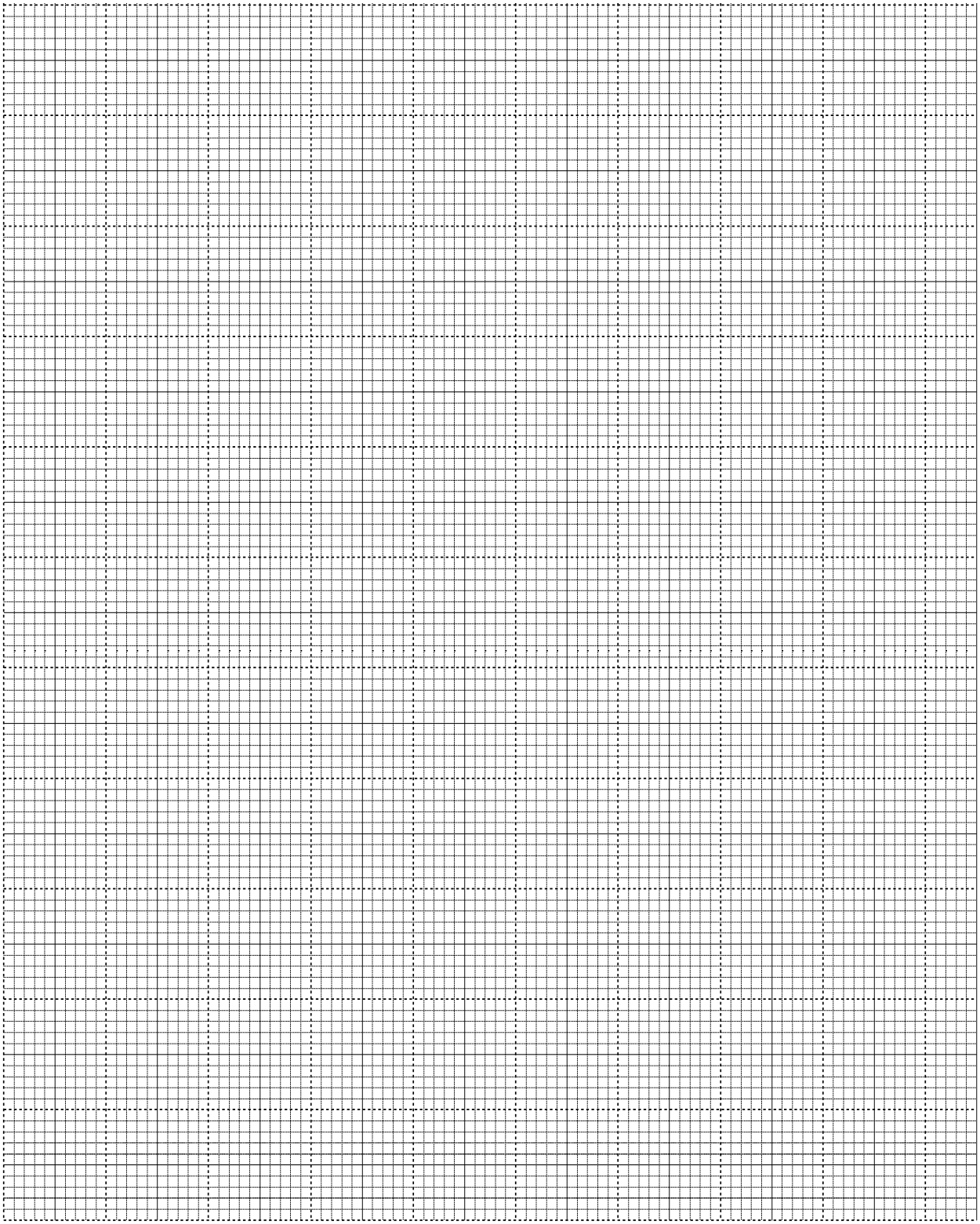
iii) Transfer all of the solution in test tube 1 into a clean 100cm^3 glass beaker. Place one piece of magnesium ribbon into the beaker and start a stop clock/watch immediately. Swirl the contents in the beaker continuously ensuring that the magnesium is always inside the solution.
In the table below, record the time taken for the magnesium ribbon to disappear
Wash the beaker each time before use in the next experiment

iv) Repeat procedure III for each of the solutions in test-tubes 2, 3 and 4 and complete the table below.

Table III

Test tube No.	1	2	3	4
Volume of solution L (cm^3)	10	8	6	4
Volume of water added (cm^3)	0	2	4	6
Time taken (sec)				
Rate of reaction $^1/_t$ sec.				

b) i) On the grid provided, plot a graph of rate of reaction ($^1/_t$) Y – axis, against volume of solution L. (4mks)



ii) Use the graph to determine the time that would be taken for a 1cm length of magnesium ribbon to disappear if the volume of the acid, solution L used was $7.5cm^3$ (2mks)

c) Why was magnesium ribbon cleaned before it was used for the experiment (1mk)

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3. You are provided with solid Q

Carry out the following tests and record your observations and inferences in the spaces provided.

a) Using a metallic spatula, take $^1/_3$ of solid Q and ignite it using a Bunsen burner flame.

Observation	Inferences
(1mk)	(1mk)

b) Place the remaining solid Q in a boiling tube. Add about $15cm^3$ of distilled water, shake the mixture until all the solid dissolves.

i) To about $5cm^3$ of the solution, add 3 drops of acidified potassium manganate (VII) solution

Observation	Inferences
(1mk)	(1mk)

ii) To about $5cm^3$ of the solution, add 3 drops of Bromine water; warm the mixture.

Observation	Inferences
(1mk)	(1mk)

iii) To about $5cm^3$ of the solution, add half spatulaful of sodium hydrogen carbonate solid.

Observation	Inferences
(1mk)	(1mk)